Product Information

Kinetix 5700 Dual-axis Inverters

Catalog Numbers 2198-D006-ERS3, 2198-D012-ERS3, 2198-D020-ERS3, 2198-D032-ERS3, 2198-D057-ERS3

ATTENTION: Read this document and the documents listed in the Additional Resources section about installation, configuration and operation of this equipment before you install, configure, operate or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

注意：在安装、配置、操作和维护本产品前，请阅读本文档以及 “ 其他资源 ” 部分列出的有关设备安装、配置和操作的相应文档。除了所有适用规范、法律和标准的相关要求之外，用户还必须熟悉安装和接线说明。

安装、调整、投运、使用、组装、拆卸和维护等各项操作必须由经过适当训练的专业人员按照适用的操作规范实施。

如果未按照制造商指定的方式使用该设备，则可能会损害设备提供的保护。

ATENCIÓN: Antes de instalar, configurar, poner en funcionamiento o realizar el mantenimiento de este producto, lea este documento y los documentos listados en la sección Recursos adicionales acerca de la instalación, configuración y operación de este equipo. Los usuarios deben familiarizarse con las instrucciones de instalación y cableado y con los requisitos de todos los códigos, leyes y estándares vigentes.

El personal debidamente capacitado debe realizar las actividades relacionadas a la instalación, ajustes, puesta en servicio, uso, ensamblaje, desensamblaje y mantenimiento de conformidad con el código de práctica aplicable.

Si este equipo se usa de una manera no especificada por el fabricante, la protección provista por el equipo puede resultar afectada.

ATENÇÃO: Leia este e os demais documentos sobre instalação, configuração e operação do equipamento que estão na seção Recursos adicionais antes de instalar, configurar, operar ou manter este produto. Os usuários devem se familiarizar com as instruções de instalação e fiação além das especificações para todos os códigos, leis e normas aplicáveis.

É necessário que as atividades, incluindo instalação, ajustes, colocação em serviço, utilização, montagem, desmontagem e manutenção sejam realizadas por pessoal qualificado e especializado, de acordo com o código de prática aplicável.

Caso este equipamento seja utilizado de maneira não estabelecida pelo fabricante, a proteção fornecida pelo equipamento pode ficar prejudicada.

ВНИМАНИЕ: Перед тем как устанавливать, настраивать, эксплуатировать или обслуживать данное оборудование, прочитайте этот документ и документы, перечисленные в разделе «Дополнительные ресурсы». В этих документах изложены сведения об установке, настройке и эксплуатации данного оборудования. Пользователи обязаны ознакомиться с инструкциями по установке и прокладке соединений, а также с требованиями всех применимых норм, законов и стандартов.

Все действия, включая установку, наладку, ввод в эксплуатацию, использование, сборку, разборку и техническое обслуживание, должны выполняться обученным персоналом в соответствии с применимыми нормами и правилами.

Если оборудование используется не предусмотренным производителем образом, защита оборудования может быть нарушена.

注意：本製品を設置、構成、稼動または保守する前に、本書および本機器の設置、設定、操作についての参考資料の該当箇所に記載されている文書に目を通してください。ユーザは、すべての該当する条例、法律、規格の要件に加えて、設置および配線の手順に習熟している必要があります。

設置調整、運転の開始、使用、組立て、解体、保守を含む諸作業は、該当する実施規則に従って訓練を受けた適切な作業員が実行する必要があります。

本機器が製造メーカにより指定されていない方法で使用されている場合、機器により提供されている保護が損なわれる恐れがあります。

ACHTUNG: Lesen Sie dieses Dokument und die im Abschnitt „Literaturverweise“ genannten Dokumente zur Installation, Konfiguration und Bedienung dieser Ausrüstung sorgfältig durch, bevor Sie dieses Produkt installieren, konfigurieren, bedienen oder instandsetzen. Benutzer müssen sich mit den Anweisungen zur Installation und Verdrahtung vertraut machen und müssen die Anforderungen aller geltenden Vorschriften, Gesetze und Normen kennen.

Aktivitäten wie Installation, Einstellung, Inbetriebnahme, Verwendung, Montage, Demontage und Instandsetzung müssen durch ausreichend geschultes Personal in Übereinstimmung mit den geltenden Durchführungsvorschriften ausgeführt werden.

Wenn diese Ausrüstung in einer Weise verwendet wird, die nicht vom Hersteller angegeben wurde, kann der von der Ausrüstung bereitgestellte Schutz beeinträchtigt sein..

ATTENTION : Lisez ce document et les documents listés dans la section Ressources complémentaires relatifs à l’installation, la configuration et le fonctionnement de cet équipement avant d’installer, configurer, utiliser ou entretenir ce produit. Les utilisateurs doivent se familiariser avec les instructions d’installation et de câblage en plus des exigences relatives aux codes, lois et normes en vigueur.

Les activités relatives à l’installation, le réglage, la mise en service, l’utilisation, l’assemblage, le démontage et l’entretien doivent être réalisées par des personnes formées selon le code de pratique en vigueur.

Si cet équipement est utilisé d’une façon qui n’a pas été définie par le fabricant, la protection fournie par l’équipement peut être compromise.

주의: 본 제품 설치, 설정, 작동 또는 유지 보수하기 전에 본 문서를 포함하여 설치, 설정 및 작동에 관한 참고 자료 섹션의 문서들을 반드시 읽고 숙지하십시오. 사용자는 모든 관련 규정 , 법규 및 표준에서 요구하는 사항에 대해 반드시 설치 및 배선 지침을 숙지해야 합니다 .

설치 , 조정 , 가동 , 사용 , 조립 , 분해 , 유지보수 등 모든 작업은 관련 규정에 따라 적절한 교육을 받은 사용자를 통해서만 수행해야 합니다 .

본 장비를 제조사가 명시하지 않은 방법으로 사용하면 장비의 보호 기능이 손상될 수 있습니다 .

ATTENZIONE Prima di installare, configurare ed utilizzare il prodotto, o effettuare interventi di manutenzione su di esso, leggere il presente documento ed i documenti elencati nella sezione “Altre risorse”, riguardanti l’installazione, la configurazione ed il funzionamento dell’apparecchiatura. Gli utenti devono leggere e comprendere le istruzioni di installazione e cablaggio, oltre ai requisiti previsti dalle leggi, codici e standard applicabili.

Le attività come installazione, regolazioni, utilizzo, assemblaggio, disassemblaggio e manutenzione devono essere svolte da personale adeguatamente addestrato, nel rispetto delle procedure previste.

Qualora l’apparecchio venga utilizzato con modalità diverse da quanto previsto dal produttore, la sua funzione di protezione potrebbe venire compromessa.

DİKKAT: Bu ürünün kurulumu, yapılandırılması, işletilmesi veya bakımı öncesinde bu dokümanı ve bu ekipmanın kurulumu, yapılandırılması ve işletimi ile ilgili İlave Kaynaklar bölümünde yer listelenmiş dokümanları okuyun. Kullanıcılar yürürlükteki tüm yönetmelikler, yasalar ve standartların gereksinimlerine ek olarak kurulum ve kablolama talimatlarını da öğrenmek zorundadır.

Kurulum, ayarlama, hizmete alma, kullanma, parçaları birleştirme, parçaları sökme ve bakım gibi aktiviteler sadece uygun eğitimleri almış kişiler tarafından yürürlükteki uygulama yönetmeliklerine uygun şekilde yapılabilir.

Bu ekipman üretici tarafından belirlenmiş amacın dışında kullanılırsa, ekipman tarafından sağlanan koruma bozulabilir.

注意事項：在安装、設定、操作或維護本產品前，請先閱讀此文件以及列於 「其他資源」章節中有關安裝、設定與操作此設備的文件。使用者必須熟悉安裝和配線指示，並符合所有法規、法律和標準要求。

包括安装、調整、交付使用、使用、組裝、拆卸和維護等動作都必須交由已經過適當訓練的人員進行，以符合適用的實作法規。

如果將設備用於非製造商指定的用途時，可能會造成設備所提供的保護功能受損。

POZOR: Než začnete instalovat, konfigurovat či provozovat tento výrobek nebo provádět jeho údržbu, přečtěte si tento dokument a dokumenty uvedené v části Dodatečné zdroje ohledně instalace, konfigurace a provozu tohoto zařízení. Uživatelé se musejí vedle požadavků všech relevantních vyhlášek, zákonů a norem nutně seznámit také s pokyny pro instalaci a elektrické zapojení.

Činnosti zahrnující instalaci, nastavení, uvedení do provozu, užívání, montáž, demontáž a údržbu musí vykonávat vhodně proškolený personál v souladu s příslušnými prováděcími předpisy.

Pokud se toto zařízení používá způsobem neodpovídajícím specifikaci výrobce, může být narušena ochrana, kterou toto zařízení poskytuje.

UWAGA: Przed instalacją, konfiguracją, użytkowaniem lub konserwacją tego produktu należy przeczytać niniejszy dokument oraz wszystkie dokumenty wymienione w sekcji Dodatkowe źródła omawiające instalację, konfigurację i procedury użytkowania tego urządzenia. Użytkownicy mają obowiązek zapoznać się z instrukcjami dotyczącymi instalacji oraz oprzewodowania, jak również z obowiązującymi kodeksami, prawem i normami.

Działania obejmujące instalację, regulację, przekazanie do użytkowania, użytkowanie, montaż, demontaż oraz konserwację muszą być wykonywane przez odpowiednio przeszkolony personel zgodnie z obowiązującym kodeksem postępowania.

Jeśli urządzenie jest użytkowane w sposób inny niż określony przez producenta, zabezpieczenie zapewniane przez urządzenie może zostać ograniczone.

OBS! Läs detta dokument samt dokumentet, som står listat i avsnittet Övriga resurser, om installation, konfigurering och drift av denna utrustning innan du installerar, konfigurerar eller börjar använda eller utföra underhållsarbete på produkten. Användare måste bekanta sig med instruktioner för installation och kabeldragning, förutom krav enligt gällande koder, lagar och standarder.

Åtgärder som installation, justering, service, användning, montering, demontering och underhållsarbete måste utföras av personal med lämplig utbildning enligt lämpligt bruk.

Om denna utrustning används på ett sätt som inte anges av tillverkaren kan det hända att utrustningens skyddsanordningar försätts ur funktion.

LET OP: Lees dit document en de documenten die genoemd worden in de paragraaf Aanvullende informatie over de installatie, configuratie en bediening van deze apparatuur voordat u dit product installeert, configureert, bediend of onderhoudt. Gebruikers moeten zich vertrouwd maken met de installatie en de bedradingsinstructies, naast de vereisten van alle toepasselijke regels, wetten en normen.

Activiteiten zoals het installeren, afstellen, in gebruik stellen, gebruiken, monteren, demonteren en het uitvoeren van onderhoud mogen uitsluitend worden uitgevoerd door hiervoor opgeleid personeel en in overeenstemming met de geldende praktijkregels.

Indien de apparatuur wordt gebruikt op een wijze die niet is gespecificeerd door de fabrikant, dan bestaat het gevaar dat de beveiliging van de apparatuur niet goed werkt.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Kinetix® 5700 Servo Drives User Manual, publication 2198-UM002	Provides information for installing, configuring, startup, and troubleshooting your Kinetix 5700 servo drive system.
Kinetix Servo Drives Specifications, publication GMC-TD003	Provides product specifications for Kinetix Integrated Motion over the EtherNet/IP network, Integrated Motion over sercos interface, EtherNet/IP networking, and component servo drive families.
Kinetix Motion Accessories Specifications, publication GMC-TD004	Provides product specifications for Bulletin 2090 motor and interface cables, connector kits, drive power components, and other servo drive accessory items.
Kinetix Motion Control Selection Guide, publication GMC-SG001	Provides an overview of Kinetix servo drives, motors, actuators, and motion accessories designed to help make initial decisions for the motion control products best suited for your system requirements.
Kinetix 5700 Drive Systems, publication GMC-RM010	Provides information to determine and select the required (drive specific) drive module, power accessory, connector kit, motor cable, and interface cable catalog numbers for your drive and motor/actuator motion control system. Includes system performance specifications and torque/speed curves (rotary motion) and force/velocity curves (linear motion) for your motion application.
System Design for Control of Electrical Noise Reference Manual, publication GMC-RM001	Information, examples, and techniques designed to minimize system failures caused by electrical noise.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation® industrial system.
Product Certifications website, http://www.rockwellautomation.com/products/certification	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequences.

SHOCK HAZARD: Labels may be on or inside the equipment (for example, drive or motor) to alert people that dangerous voltage may be present.

IMPORTANT Identifies information that is critical for successful application and understanding of the product.

ATTENTION: Only qualified personnel familiar with servo drives and associated machinery should plan or implement the installation, startup, and subsequent maintenance of the system. Failure to comply can result in personal injury and/or equipment damage.

ATTENTION: An incorrectly applied or installed drive can result in component damage or a reduction in product life. Wiring or application errors such as undersizing the motor, incorrect or inadequate AC supply, or excessive surrounding air temperatures can result in malfunction of the system.

ATTENTION: Drive **must not** be installed in an area where the ambient atmosphere contains volatile or corrosive gas, vapors, or dust. If the drive is not going to be installed for a period of time, it must be stored in an area where it will not be exposed to a corrosive atmosphere.

Specifications

Attribute	2198-D006-ERS3	2198-D012-ERS3	2198-D020-ERS3	2198-D032-ERS3	2198-D057-ERS3
Surrounding air temperature Operating Storage	0…50 °C (32…122 °F) -40…70 °C (-40…158 °F)				
Weight, kg (lb) approx	4.16 (9.17)				6.76 (14.9)
Short circuit current rating	200,000 A rms symmetrical				
Branch circuit short circuit protection	Integral solid-state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the Nation al Electric Code (NEC) and any additional local codes.				
Leakage current	• Kinetix 5700 drives produce leakage current in the protective-earthing conductor that exceeds 3.5 mA AC and/or 10 mA DC. The minimum size of the protective-earthing (grounding) conductor used in the application must comply with local safety regulations for high protective-earthing conductor current equipment. • Kinetix 5700 drives produce DC current in the protective-earthing conductor and can reduce the ability of a residual current device (RCD) or residual current monitor (RCM) of type A or AC to provide protection for the drive and other equipment in the installation.				

Motor Overload Protection

This servo drive uses solid-state motor overload protection that operates in accordance with UL 61800-5-1. Motor overload protection is provided by algorithms that estimate actual motor temperature based on operating conditions as long as control power is continuously applied. However, when control power is removed, thermal memory is not retained.

In addition, this drive provides an input for an external temperature sensor/thermistor device, embedded in the motor, to support the UL requirement for motor overload protection. Specifically, the Kinetix VP motors perform motor temperature monitoring to support the UL requirement for motor overload protection.

Some motors supported by this drive do not contain temperature sensors/thermistors; therefore, motor overload protection against excessive consecutive motor overloads with power cycling is not supported.

This servo drive meets the following UL 61800-5-1 requirements for solid-state overload protection.

Motor Overload Protection Trip Point	Value
Ultimately	100% overload
Within 8 minutes	200% overload
Within 20 seconds	600% overload

ATTENTION: To avoid damage to your motor due to overheating caused by excessive, successive motor overload trips, follow the wiring diagram provided in the user manual for your motor and drive combination.

Refer to your servo drive user manual for the interconnect diagram that illustrates the wiring between your motor and drive.

Remove the Grounding Screw in Select Power Configurations

Remove the grounding screw when using ungrounded, corner-grounded, and impedance-grounded power configurations. Also, remove the grounding screw when using the Bulletin 8720MC regenerative power supply, or any active converter.

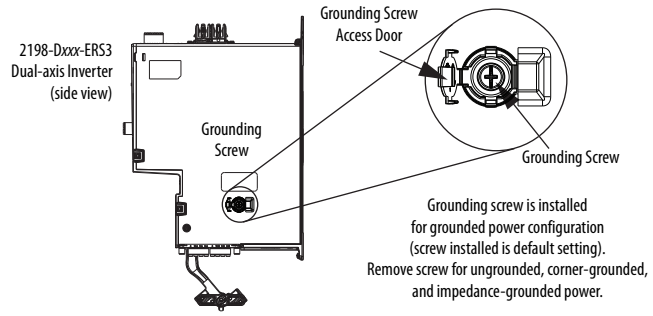
IMPORTANT If you have grounded-wye power distribution, you do not need to remove the screw. EMC performance can be affected if you remove the grounding screw.

We recommend that you remove the grounding screw when the drive is removed from the panel and placed on its side on a solid surface equipped as a grounded static-safe workstation.

ATTENTION: When you remove the grounding screw, the risk of equipment damage exists because the unit no longer maintains line-to-neutral voltage protection.

To access the grounding screw on dual-axis inverters, open the small plastic door on the right side of the module.

Remove the Grounding Screw



ATTENTION: To avoid personal injury, the grounding screw access door must be kept closed when power is applied. If power was present, and then removed, wait at least 5 minutes for the DC-bus voltage to dissipate, and verify that no DC-bus voltage exists before accessing the grounding screw.

ATTENTION: Risk of equipment damage exists. The drive ground configuration must be accurately determined. Leave the grounding screw installed for grounded power configurations (default). Remove the screw for ungrounded, corner-grounded, and impedance-grounded power, or when an active converter supplies the DC-bus voltage.

Grounding Screw Configurations

Ground Configuration (1)	Grounding Screw Configuration	Benefits of Configuration
Grounded (wye)	Installed (default setting)	• UL and EMC compliance • Reduced electrical noise • Most stable operation • Reduced voltage stress on components and motor bearings
• AC-fed ungrounded • Corner grounded • Impedance grounded	Removed	• Helps avoid severe equipment damage when ground fault occurs • Reduced leakage current
DC-bus from active converter		

(1) Refer to the Kinetix 5700 Servo Drives User Manual, publication 2198-UM002, for example configurations.

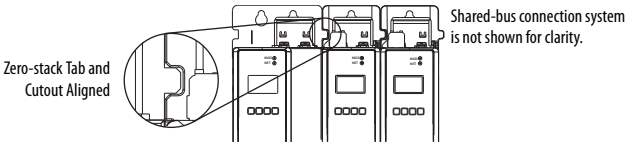
Mount the Dual-axis Inverter

Observe these clearance requirements when mounting the dual-axis inverter:

- Additional clearance is required for cables and wires or the shared-bus connection system connected to the top of the drive.
- Additional clearance is required if other devices are installed above and/or below the drive and have clearance requirements of their own.
- Additional clearance left and right of the drive is required when mounted adjacent to noise sensitive equipment or clean wire ways.
- The recommended minimum cabinet depth is 300 mm (11.81 in.).

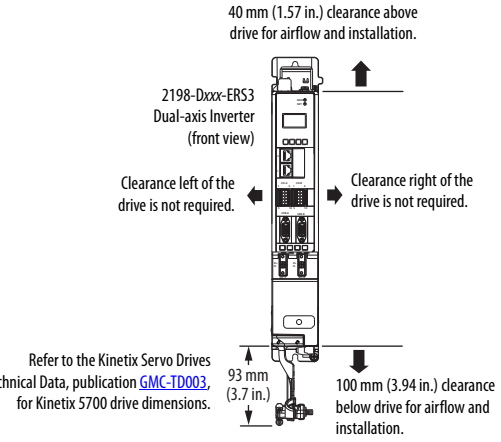
Refer to the Kinetix Servo Drives Technical Data, publication GMC-TD003, for Kinetix 5700 drive dimensions.

The Kinetix 5700 drive system must be spaced by aligning the zero-stack tab and cutout. For hole patterns, refer to the Kinetix 5700 Servo Drives User Manual, publication 2198-UM002.



Mount the Kinetix 5700 servo drives to the cabinet subpanel with M5 (#10-32) steel bolts torqued to 4.0 N•m (35.4 lb•in), max.

Minimum Clearance Requirements

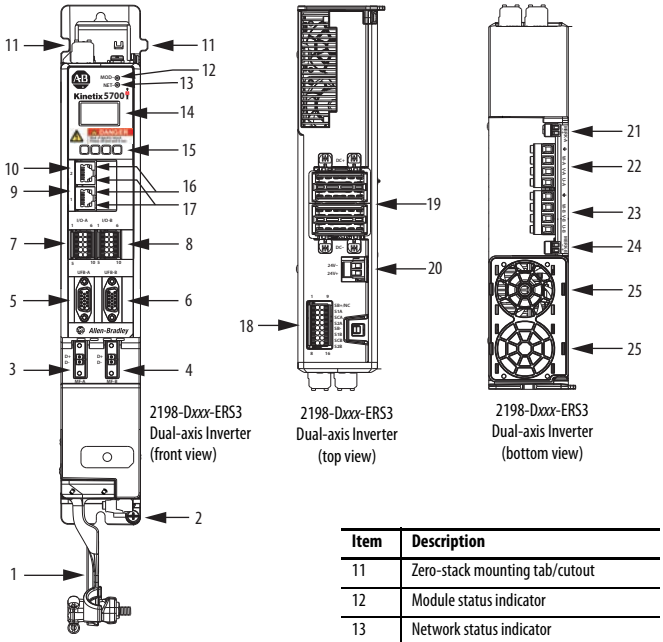


IMPORTANT Mount the drive in an upright position as shown. Do not mount the drive on its side.

Connector Data

Use this illustration to identify the dual-axis inverter features and indicators.

Dual-axis Inverters Features and Indicators (2198-D006-ERS3 inverter is shown)



Item	Description
1	Motor cable clamp
2	Ground lug
3	Motor feedback (MF) connector - A
4	Motor feedback (MF) connector - B
5	Universal feedback (UFB) connector - A

Item	Description
6	Universal feedback (UFB) connector - B
7	Digital inputs (IOD) connector - A
8	Digital inputs (IOD) connector - B
9	Ethernet (PORT1) RJ45 connector
10	Ethernet (PORT2) RJ45 connector

Item	Description
11	Zero-stack mounting tab/cutout
12	Module status indicator
13	Network status indicator
14	LCD display
15	Navigation push buttons
16	Link speed status indicators
17	Link/Activity status indicators
18	Safe torque-off (STO) connector
19	DC bus (DC) connector
20	24V control input power (CP) connector

Item	Description
21	Motor brake (BC) connector - A
22	Motor power (MP) connector - A
23	Motor power (MP) connector - B
24	Motor brake (BC) connector - B
25	Cooling fan

Wiring Requirements

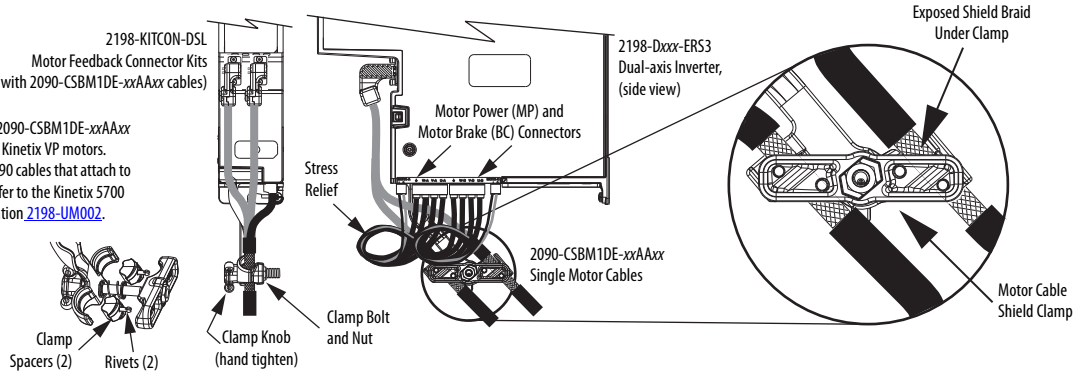
Dual-axis Inverter Cat. No.	Description	Connects to Terminals		Wire Size mm ^{2} (AWG)	Strip Length mm (in.)	Torque Value N•m (lb•in)
		Pin	Signal			
2198-D006-ERS3 2198-D012-ERS3 2198-D020-ERS3 2198-D032-ERS3	Motor power (axis A and B)	U V W ⏚	U V W ⏚	Motor power cable depends on motor/drive combination. 0.75…2.5 (1) (18…14)	10.0 (0.39)	0.5…0.6 (4.4…5.3)
2198-D057-ERS3				2.5…6 (1) (14…10)	10.0 (0.39)	0.5…0.8 (4.4…7.1)
2198-D*xxx*-ERS3	PELV/SELV 24V power (connector plug)	CP-1 CP-2	24V+ 24V–	0.5…2.5 (20…14)	7.0 (0.28)	0.22…0.25 (1.9…2.2)
	Brake power (axis A and B)	BC-1 BC-2	MBRK+ MBRK–	N/A (2)		
	DC Bus power	Bus bar	DC– DC+	N/A (3)	N/A (3)	N/A (3)
	Safety	ST0-1 ST0-2 ST0-3 ST0-4 ST0-5 ST0-6 ST0-7 ST0-8	SB+ /NC S1A SCA S2A SB- S1B SCB S2B	0.14…1.5 (26…16)	10.0 (0.39)	N/A (4)
	Digital inputs	IOD-1 IOD-2 IOD-3 IOD-4 IOD-5 IOD-6 IOD-7 IOD-8 IOD-9 IOD-10	IN1 COM IN2 COM SHLD IN3 COM IN4 COM SHLD	0.14…1.5 (26…16)	10.0 (0.39)	N/A (4)

(1) Building your own cables or using third-party cables for Kinetix VP motors is not an option. Use 2090-CS*x*M1DE single motor cables. Refer to the Kinetix Motion Accessories Specifications Technical Data, publication GMC-TD004, for cable specifications.
(2) Motor brake wires are included (when specified) in the Bulletin 2090 motor cable.
(3) Shared DC-bus power connections are always made from one drive to another over the bus-bar connection system. These terminals do not receive discrete wires.
(4) This connector uses spring tension to hold wires in place.

Shield Clamp Installation

Factory-supplied 2090-Series single motor cables are shielded and the braided cable shield must terminate at the drive during installation. The exposed area must be clamped (with the clamp provided) at the bottom front of the drive. Clamp spacers, included with the dual-axis inverters and held captive by rivets, are not needed for Kinetix VP motor installations, and can be removed.

This shield clamp example illustrates 2090-CSBM1DE-*xx*AA*xx* single motor cables that attach to Kinetix VP motors. For example illustrations of Bulletin 2090 cables that attach to MP-Series™ motors and actuators, refer to the Kinetix 5700 Servo Drives User Manual, publication 2198-UM002.



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